CLAIMS

We claim:

1. A method of coordinating slotted multiple access in a wireless network channel shared by a plurality of users comprising the steps of utilizing a polling mode, utilizing a contention mode and utilizing a seamless transition between the polling and contention modes to coordinate user transmission.

2. The method of claim 1 further comprising assigning each of a plurality of users a distinct address from an address pool.

3. The method of claim 2 wherein the address pool contains 2^k addresses, the maximum number of users within one channel.

4. The method of claim 2 further comprising dynamically splitting the address pool into 2^x subgroups.

5. The method of claim 4 further comprising transmitting only the users belonging to a specific subgroup at any transmission opportunity.

6. The method of claim 5 further comprising starting of a multiple access cycle where x could be any number from 0 to k.

7. The method of claim 6 wherein the contention mode occurs when x=0 and only one subgroup exists allowing every user to transmit.

8. The method of claim 6 wherein the polling mode occurs when x=k and there are 2^k subgroups containing only one user.

9. The method of claim 6 wherein the seamless transition between the polling mode and the contention mode occurs by changing the x parameter.

10. The method of claim 1 further comprising applying a contention resolution algorithm when a user signal collides with another.

11. The method of claim 10 wherein when a collision occurs between two users the subgroup x will be split into two subgroups (x=x+1), both subgroups containing half the number of users in the parent groups.

12. The method of claim 10 wherein when another collision between two user signals occurs, the subgroup will again split.

13. The method of claim 10 wherein when collisions no longer occur in any subgroup, the multiple access cycle ends and a new cycle begins.

14. An apparatus for coordinating slotted multiple access in a wireless network channel shared by a plurality of users comprising:

a. means for implementing a polling mode to facilitate user transmission when there is one user in every subgroup;

b. means for implementing a contention mode to facilitate user transmission when there are no subgroups; and

c. means for providing a seamless transition between the polling and contention modes to coordinate user transmission.

15. The apparatus of claim 14 further including means for assigning each of a plurality of users a distinct address from an address pool.

16. The apparatus of claim 15 wherein the address pool contains 2^k addresses, the maximum number of users within one channel.

17. The apparatus of claim 15 further including means for dynamically splitting the address pool into 2^x subgroups.

18. The apparatus of claim 17 further including means for transmitting only the users belonging to a specific subgroup at any transmission opportunity.

19. The apparatus of claim 18 further including means for starting of a multiple access cycle where x could be any number from 0 to k.

20. The apparatus of claim 19 wherein the contention mode occurs when x=0 and only one subgroup exists allowing every user to transmit.

21. The apparatus of claim 19 wherein the polling mode occurs when x=k and there are 2^k subgroups containing only one user.

22. The apparatus of claim 19 wherein the seamless transition between the polling mode and the contention mode occurs by changing the x parameter.

23. The apparatus of claim 14 further including means for applying a contention resolution algorithm when a user signal collides with another.

24. The apparatus of claim 23 wherein when a collision occurs between two users the subgroup x will be split into two subgroups (x=x+1), both subgroups containing half the number of users in the parent groups.

25. The apparatus of claim 23 wherein when another collision between two user signals occurs, the subgroup will again split.

26. The apparatus of claim 23 wherein when collisions no longer occur in any subgroup, the multiple access cycle ends and a new cycle begins.

27. An apparatus for coordinating slotted multiple access in a wireless network channel shared by a plurality of users comprising:

a. an ATM cube for operating a high speed wireless network consisting of a plurality of horizontal and vertical management layers;

b. a hub for transmitting and receiving wireless network signals such that the hub may receive requests and assign portions of a communication bandwidth; and

c. a plurality of end user nodes for transmitting and receiving wireless network signals such that a plurality of users may request or be granted a portion of the communication bandwidth.

28. The apparatus of claim 27 wherein the hub assigns each of a plurality of users a distinct address from an address pool.

29. The apparatus of claim 28 wherein the address pool contains 2^k addresses, the maximum number of users within one channel.

30. The apparatus of claim 28 wherein the address pool may be dynamically split into 2^x subgroups.

31. The apparatus of claim 30 wherein at any transmission opportunity only the users belonging to a specific subgroup transmit.

32. The apparatus of claim 31 wherein the hub starts a multiple access cycle where x could be any number from 0 to k.

33. The apparatus of claim 32 wherein the contention mode occurs when x=0 and only one subgroup exists allowing every user to transmit.

34. The apparatus of claim 32 wherein the polling mode occurs when x=k and there are 2^k subgroups containing only one user.

35. The apparatus of claim 32 wherein the seamless transition between the polling mode and the contention mode occurs by changing the x parameter.

36. The apparatus of claim 27 wherein the hub implements a contention resolution algorithm when a user signal collides with another.

37. The apparatus of claim 36 wherein when a collision occurs between two users the subgroup x will be split into two subgroups (x=x+1), both subgroups containing half the number of users in the parent groups.

38. The apparatus of claim 36 wherein when another collision between two user signals occurs, the subgroup will again split.

39. The apparatus of claim 36 wherein when collisions no longer occur in any subgroup, the multiple access cycle ends and a new cycle begins.